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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,792	12/28/2000	Zhong-Ning (George) Cai	2207/10615	6261

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EXAMINER

CHEN, TSE W

ART UNIT	PAPER NUMBER
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2116

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,792

Applicant(s)

CAI, ZHONG-NING (GEORGE)

Examiner

Tse Chen

Art Unit

2116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment A, Drawings and Corrections dated February 17, 2004.
2. Claims 1-17 are presented for examination.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Georgiou et al, U.S. Patent 5940785, hereinafter referred to as Georgiou, in view of Ko, U.S. Patent 6192479.
5. As per claim 1, Georgiou taught an invention comprising:
 - a sensor [119, fig. 1]; and
 - a circuit, responsive to the measured thermal characteristic satisfying a predetermined threshold [col. 4, lines 26 – 33] for reducing the clock frequency of the processor [col. 3, lines 60 – 64, col. 4, 35 – 37, 48 – 50].
6. However, Georgiou did not disclose expressly a performance demanding level input to determine a level of sensitivity for frequency reduction.
7. Ko taught an invention for power management of a processing device, the invention comprising of a circuit for reducing the clock frequency with a performance demanding level input to determine a level of sensitivity for frequency reduction [FIG. 5; column 7, lines 7-16; column 8, lines 1-12].

8. An ordinary artisan at the same time the invention was made would have been motivated to look for a way to incorporate a performance demand input to better control power conservation [see Ko: column 2, lines 10-35].

9. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Georgiou and Ko because of the aforementioned motivation and also their involvement in similar problems regarding power management in a processing system environment.

10. As per claim 2, Georgiou taught the thermal characteristic which includes temperature and rate of temperature change [col. 4, lines 26 – 33].

11. As per claim 3, Georgiou taught a frequency generator and a logic circuit [fig. 4, col. 8, line 42 – 66].

12. As per claim 4, Georgiou reduces the clock frequency by less than fifty percent [col. 8, lines 48 – 49].

13. As per claim 5, Ko reduces the clock frequency by removing a pre-determined number of transitions from a signal producing the clock frequency [column 5, lines 53-58].

14. As per claim 6, Georgiou would slow down the processor when it runs too hot thereby allowing the processor, inherently, to run at a higher operating temperature.

15. As per claims 7 – 11, Georgiou and Ko taught the claimed apparatus. Therefore, Georgiou and Ko taught the method in operating the apparatus.

16. As per claim 12, Georgiou taught the steps of:

- entering a first state [normal operating state with normal clock frequency] from a second state [overheat state] in response to a measured thermal characteristic of a

processor with a clock frequency failing to satisfy a first predetermined threshold [threshold temperature 230 which indicates the processor is overheating]¹ ;

- remaining in the first state in response to a measured thermal characteristic of the processor failing to satisfy the first pre-determined threshold [the processor remain in the normal operating state when its temperature fails to rise above the threshold temperature]; and
- entering the second state from the first state in response to a measured thermal characteristic of the processor satisfying the first predetermined threshold [the processor enters the overheating state when the heat sensor indicates the temperature is above the threshold temperature].

17. As per claims 13 – 17, Georgiou taught the usage of temperature and rate of temperature change of the predetermined thresholds [col. 4, lines 30 – 34].

Response to Arguments

18. Applicant's arguments, see pages 8-9 of Amendment A, filed February 17, 2004, with respect to the specification have been fully considered and are persuasive. The objections of the specification has been withdrawn.

19. Applicant's arguments, see pages 9-10 of Amendment A, filed February 17, 2004, with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendments.

Conclusion

¹ After the processor enters into a overheating state, the processor's clock frequency will be reduced until the processor is cooling off. Thereafter, the processor returns to its normal operating state, col. 9, lines 22 - 25.

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20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- a. Herbert, U.S. Patent 5798667, disclosed an invention for controlling the clock frequency by removing a pre-determined number of transitions.
- b. Mittal et al., U.S. Patent 5719800, disclosed an invention to reduce power consumption by throttling the clock frequency based on performance demand.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tse Chen whose telephone number is (703) 305-8580. The examiner can normally be reached on Monday - Friday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Lee can be reached on (703) 305-9717. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tse Chen
April 2, 2004



THOMAS LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100